The NASA Small Business Innovation Research (SBIR) AND STTR Program

Presentation to the National SBIR/STTR Conference – Madison, WI

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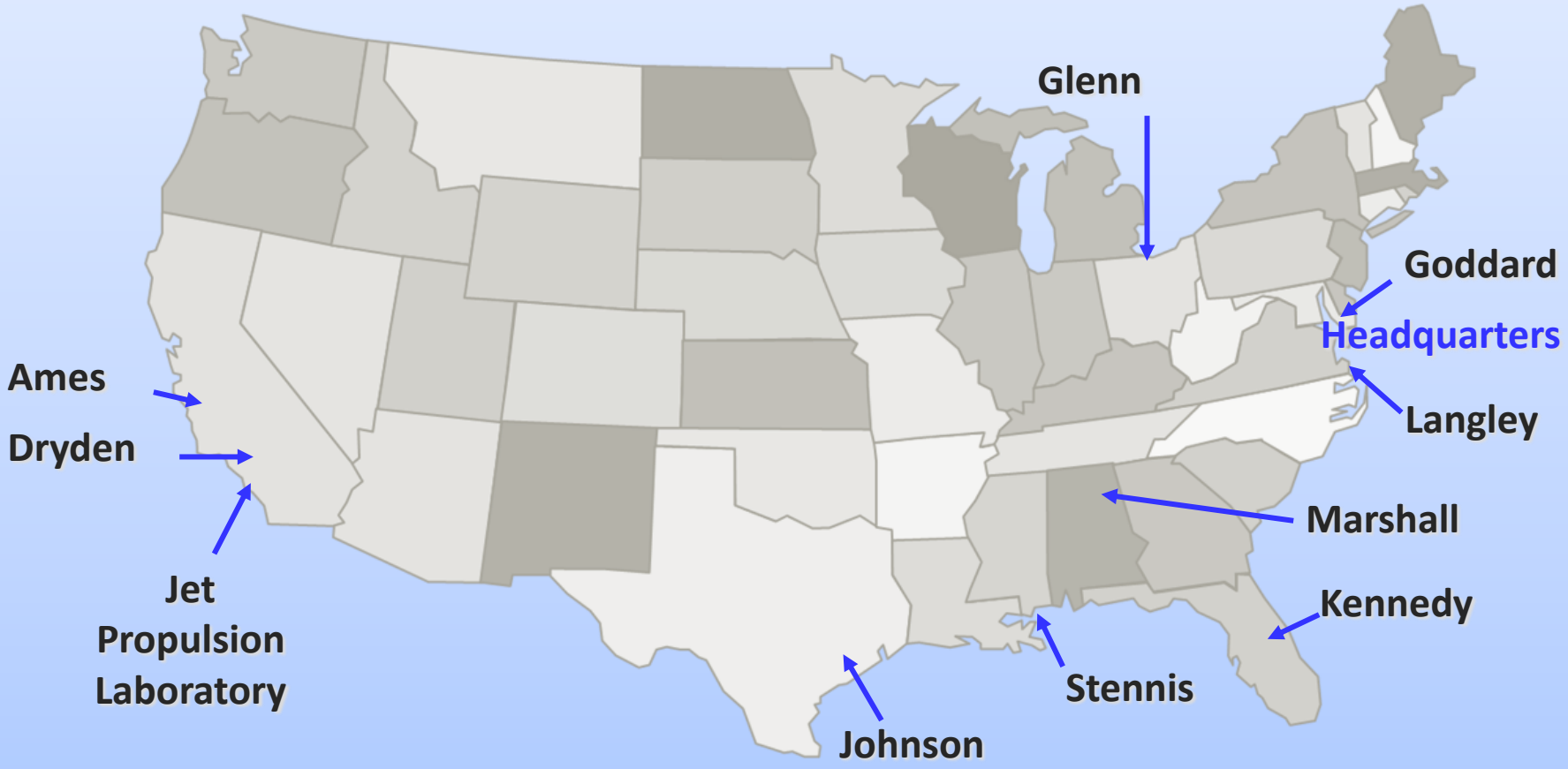
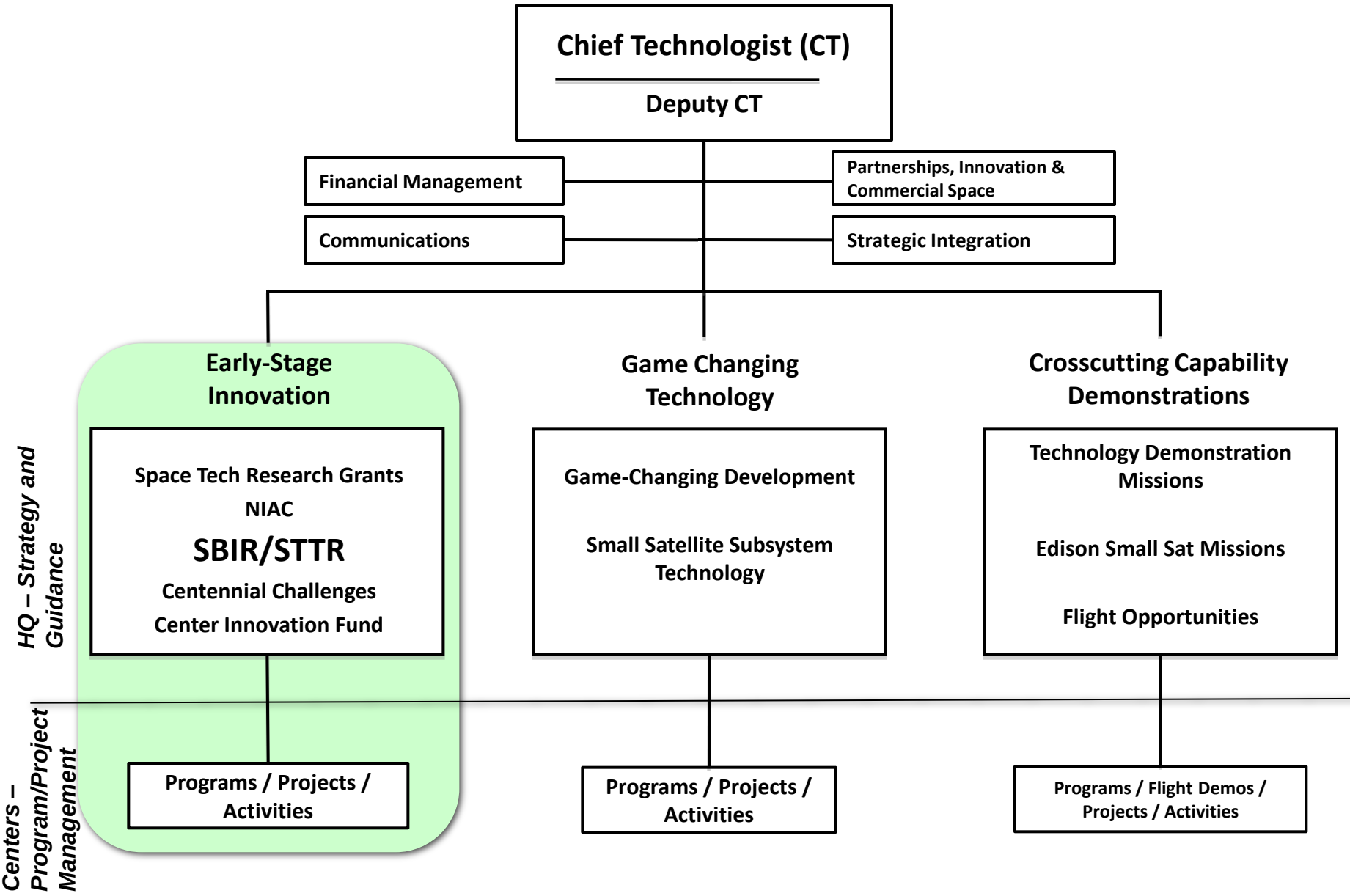
Heather Morgan REI

April 11, 2011

NASA Participating Centers



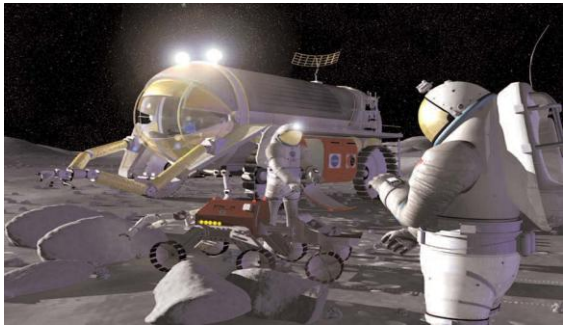
NASA Office of the Chief Technologist (OCT)



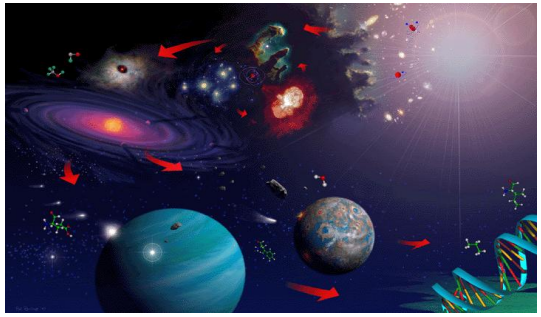
NASA SBIR/STTR OCT Transition

- Now as an integral part of Space Technology Program, they will continue to build on their rich history and invest in both ideas and small companies across the Nation.
- The Center Chief Technologists will enhance the coordination between the SBIR/STTR programs and Mission Directorates on topic development, selection and reporting processes .

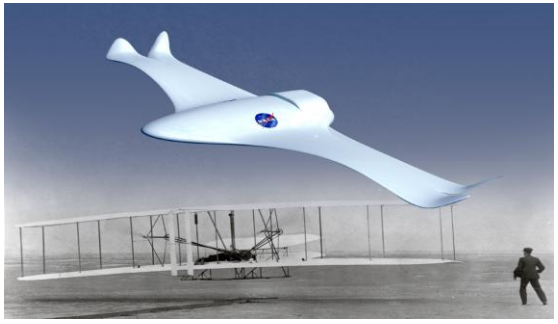
Exploration Systems



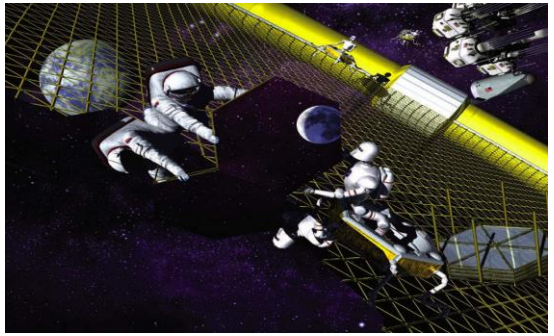
Science



Aeronautics



Space Operations



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SBIR/STTR Background – Program Purpose

The statutory purpose of the SBIR/STTR Programs is to strengthen the role of innovative small business concerns (SBC)s in federally-funded research or research and development (R/R&D).

Specific program purposes are to:

(1) Stimulate technological innovation;

(2) Use small business to meet Federal R/R&D needs;

(3) Foster and encourage participation by socially and economically disadvantaged SBCs,

(4) increase private sector commercialization of innovations derived from Federal R/R&D, thereby increasing competition, productivity and economic growth,

(5) and through STTR encourage cooperative research and development with non-profit research institutions, such as a universities; with the primary objective of facilitating the transfer of technology from research institutions through the entrepreneurship of small business contracts

NASA Strategic Approach

- Every technology development investment dollar is critical to the ultimate success of NASA's mission
  - Ensure alignment and integration with Mission Directorates' priorities
  - Investments should be complementary with technologies being pursued by
    - other OCT investments and partnerships
    - Mission Directorates' programs and projects
    - prime contractors
    - other agency SBIR/STTR investments

- Ultimate objective is to achieve infusion of critical technologies into NASA's Mission Directorates'
  - flight programs/projects
  - ground or test systems
  - or other uses to advance NASA's mission

- Mission Directorates establish high priority needs and existing gaps
  - High priority needs are developed into topics for the annual solicitation
  - Subtopics may be clustered to support the development and maturation of critical technologies for infusion

Inherent Challenges of Space Systems

- Surviving Launch Conditions: high g-load, vibration, payload fairing, deployment
- Functioning in Extreme Environments: radiation, temperature, gravity, vacuum
- Limiting Power Availability
- High Degree of Autonomy and Reliability
- Long Range Communication and Navigation

SBIR/STTR: 3-Phase Programs (FY10 solicitations)

- **Phase 1**
  - Feasibility study
  - $125K Contract Award (contingent on budget and reauthorization)
  - 6 months duration (SBIR)
  - 12 months duration (STTR)
- **Phase 2**
  - Technology Development
  - 2-Year Contract Award
  - $750K (SBIR/STTR) (contingent on budget and reauthorization)
  - **$150K Phase-2E/Phase 3 Bridge Option (New program Feature)** (possible $250K – contingent on budget and reauthorization)
- **Phase 3**
  - Technology Infusion/Commercialization Stage
  - Use of non-SBIR Funding Agreements
  - Ability to award sole-source contracts without further need for Justification Other than Full and Open competition; (No JOFOC) based on specific SBIR authority

Budget and Award Numbers

SBIR	FY09	FY10	FY11*	FY12
Millions of $	113.4	124.1	124.1	154.7
Phase 1 Awards	335	366	450	TBD
Phase 2 Awards	143	152	215	TBD
Phase 2E Awards	N/A	N/A	25	TBD

* PY 2009 solicitation Phase 2 and PY 2010 solicitation Phase 1 awards

STTR	FY09	FY10	FY11	FY12
Millions of $	13.6	14.1	14.1	18.6
Phase 1 Awards	32	42	45	TBD
Phase 2 Awards	16	18	27	TBD
Phase 2E Awards	N/A	N/A	0	TBD

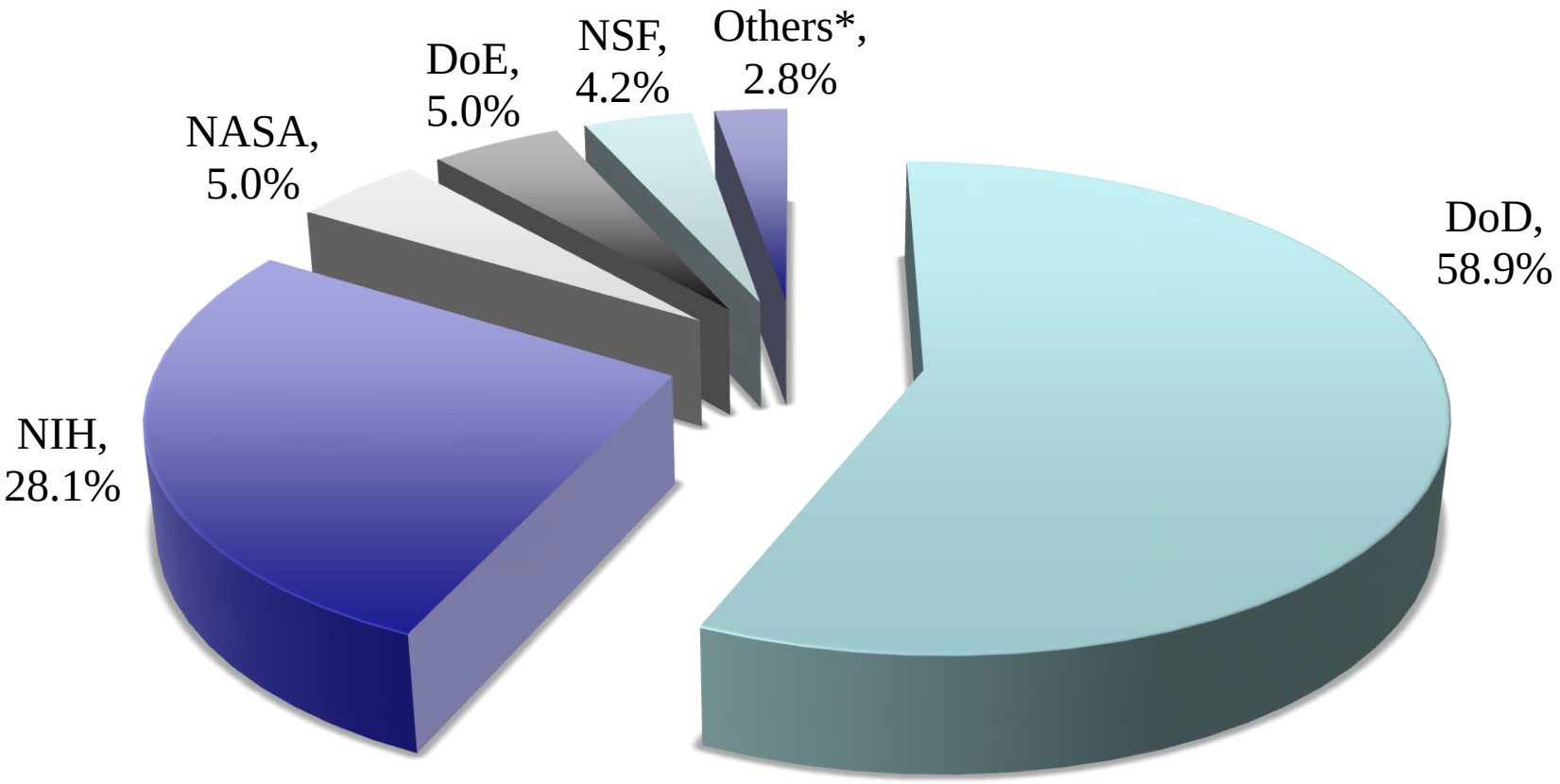
Assumes

Phase I =100K (FY12= 125K) – contingent on budget and reauthorization

Phase II = 600K (FY12= 750K) – contingent on budget and reauthorization

Phase IIE =150K (FY12= 250K) – contingent on budget and reauthorization

SBIR/STTR Agency Funding FY2010 ~2.6 B



*Others Indicate: DHS, DoC, DoT, EPA, ED, USDA,

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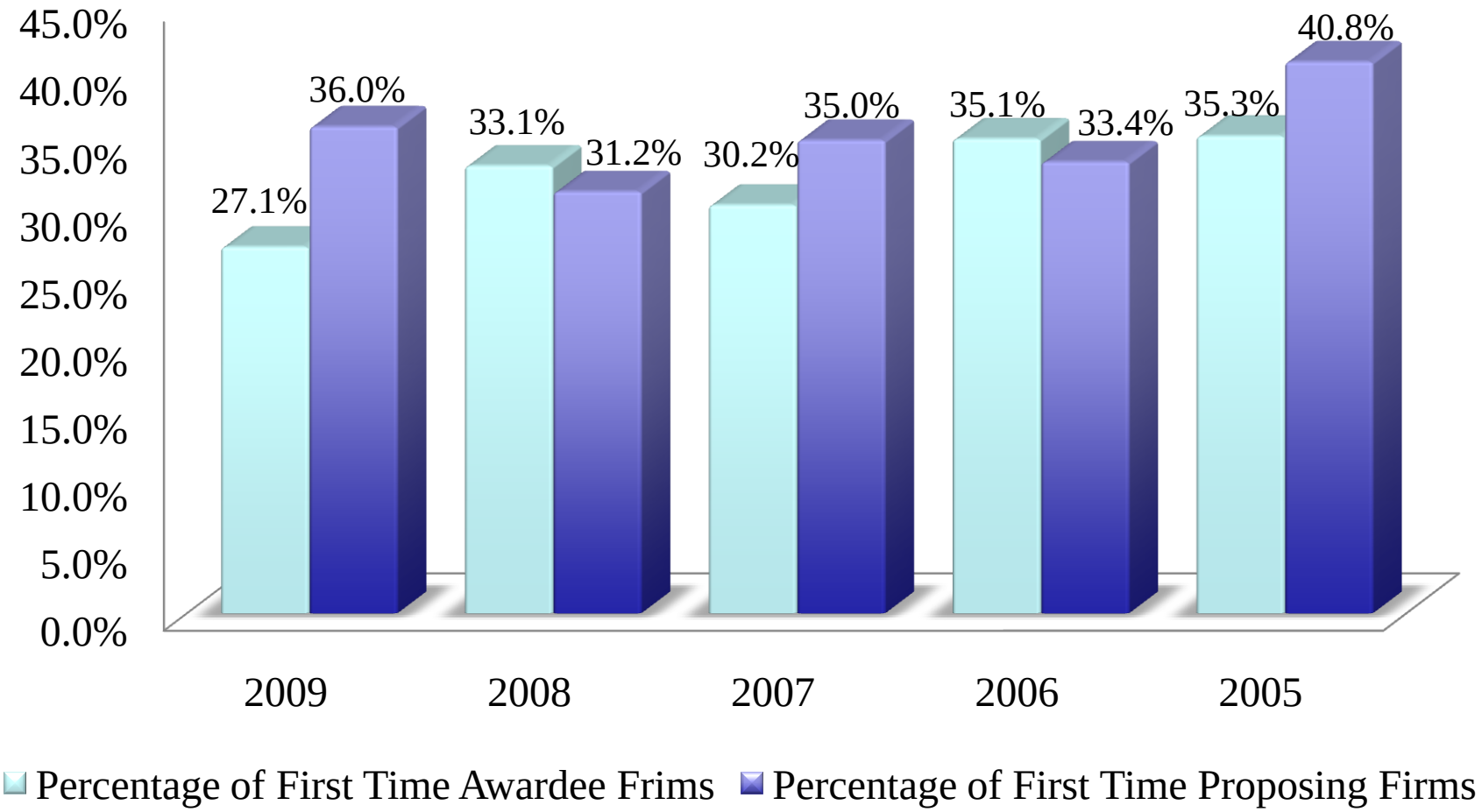
Five year span of NASA SBIR/STTR
First time Awardee Firms Vs First time Proposing Firms



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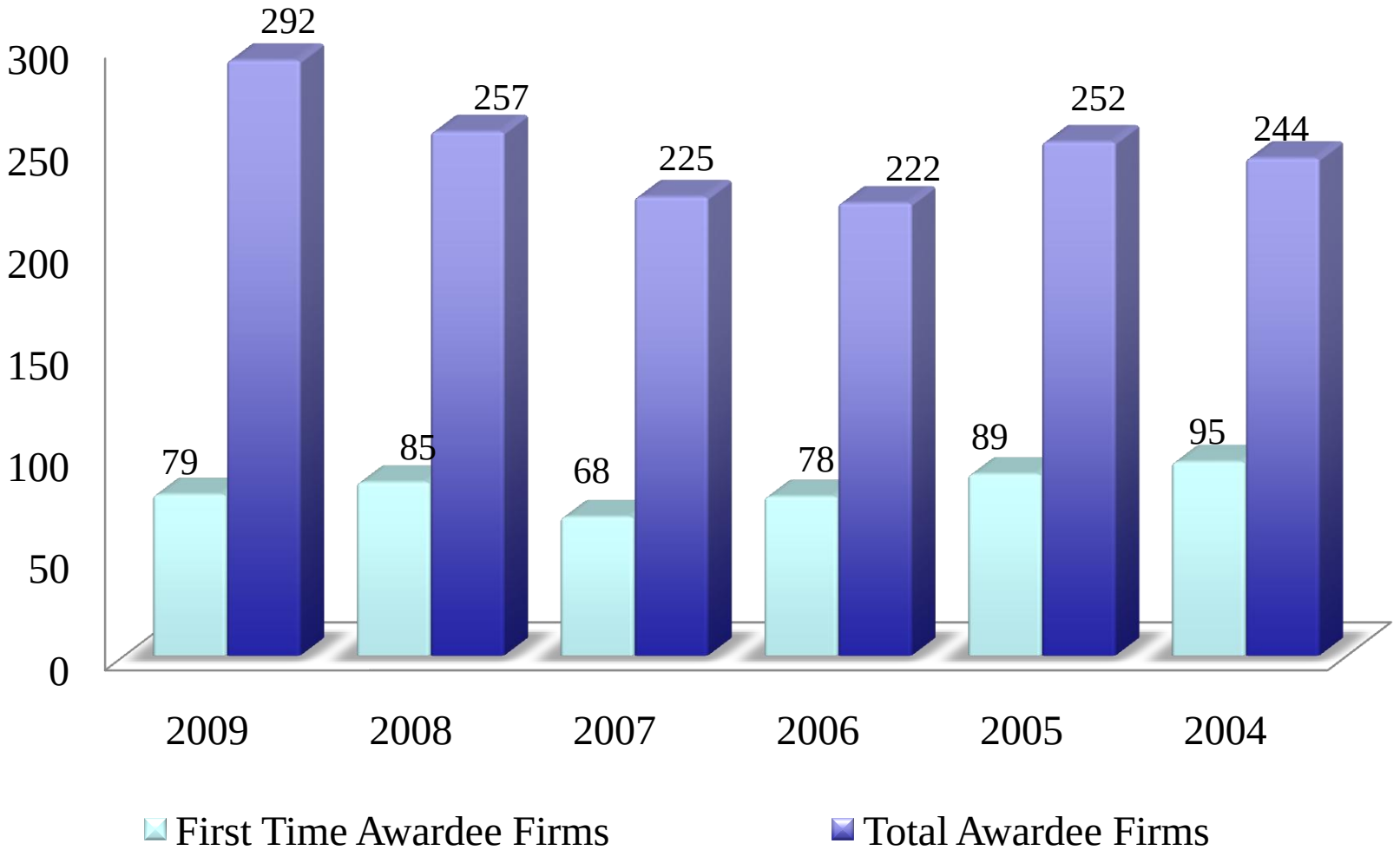
Five year span of NASA SBIR/STTR
First time Awardee Firms Vs Total Awardee Firms



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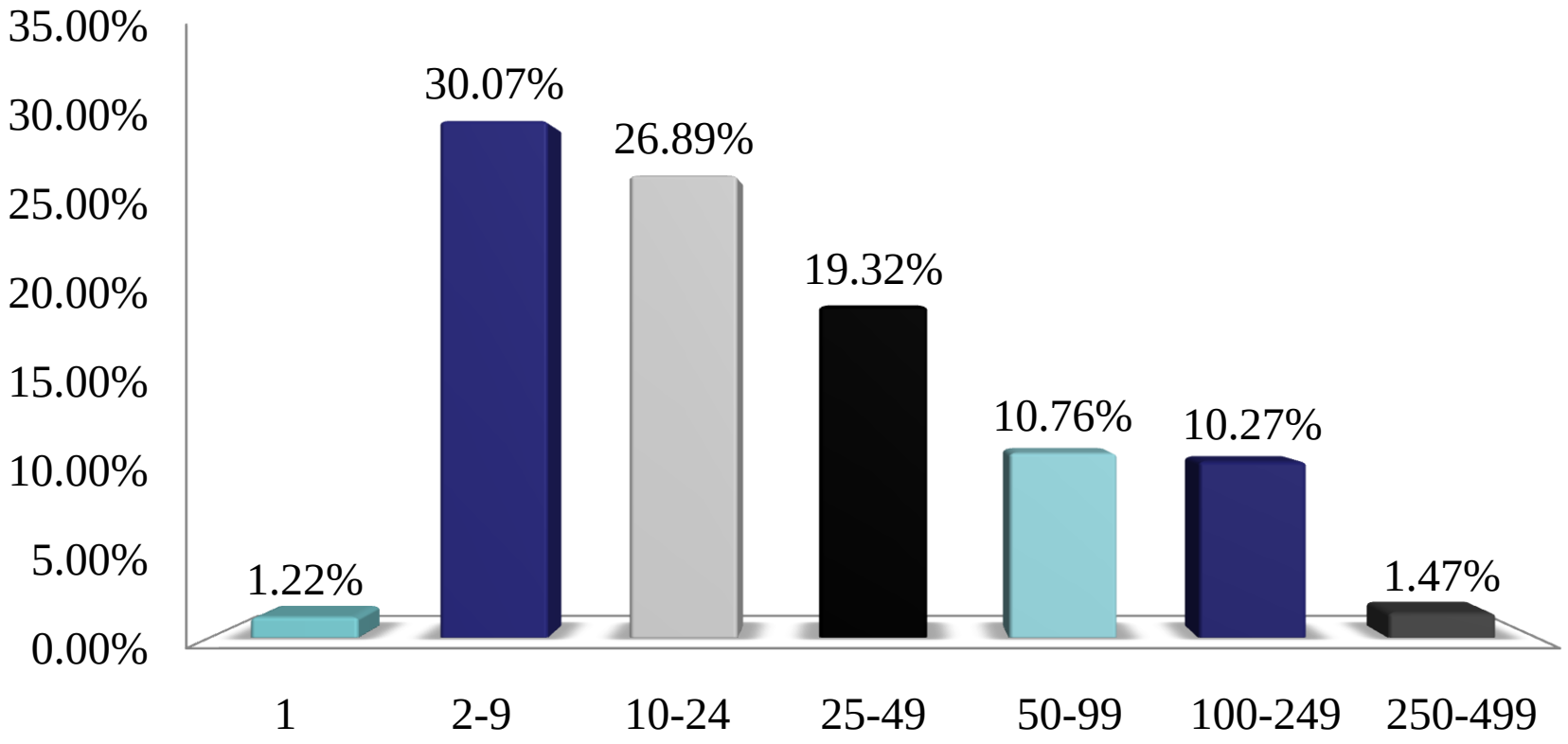
Who Participates in NASA SBIR?

- ✓ Firms are typically small and new to the program
- ✓ About 1/3 are first-time Phase I awardees.
- ✓ Small hi-tech firms from across the country.



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SBIR FY2010 Solicitation Program Content

Aeronautics Research

Topic	Topic Title
A1	Aviation Safety
A2	Fundamental Aeronautics
A3	Airspace Systems
A4	Aeronautics Test Technologies
A5	Integrated System Research Project (ISRP)

Science

Topic	Topic Title
S1	Sensors, Detectors and Instruments
S2	Advanced Telescope Systems
S3	Spacecraft and Platform Subsystems
S4	Low-Cost Small Spacecraft and Technologies
S5	Robotic Exploration Technologies
S6	Information Technologies

Space Operations

Topic	Topic Title
O1	Space Communications
O2	Space Transportation
O3	Processing and Operations
O4	Navigation

Exploration Systems

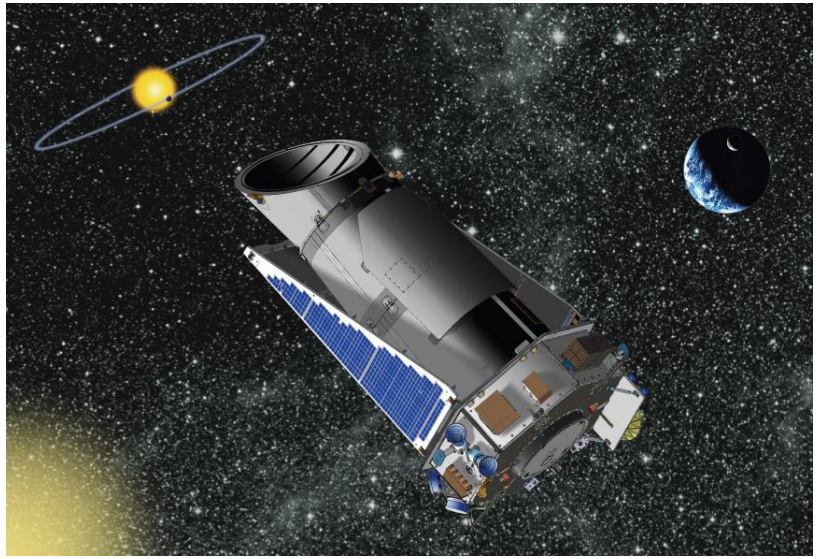
Topic	Topic Title
X1	In Situ Resource Utilization
X2	Advanced Propulsion
X3	Life Support and Habitation Systems
X4	Extra-Vehicular Activity Technology
X5	Lightweight Spacecraft Materials and Structures
X6	Autonomous Systems and Avionics
X7	Human-Robotic Systems
X8	High-Efficiency Space Power Systems
X9	Entry, Descent, and Landing (EDL) Technology
X10	Cryogenic Propellant Storage and Transfer
X11	Exploration Crew Health Capabilities
X12	Exploration Medical Capability
X13	Behavioral Health and Performance
X14	Space Human Factors and Food Systems
X15	Space Radiation
X16	In-flight Biological Sample Preservation and Analysis

2010 Aeronautics Research Topics

- Aviation Safety
- Fundamental Aeronautics
- Airspace Systems
- Aeronautics Test Technologies
- Integrated System Research Project (ISRP)

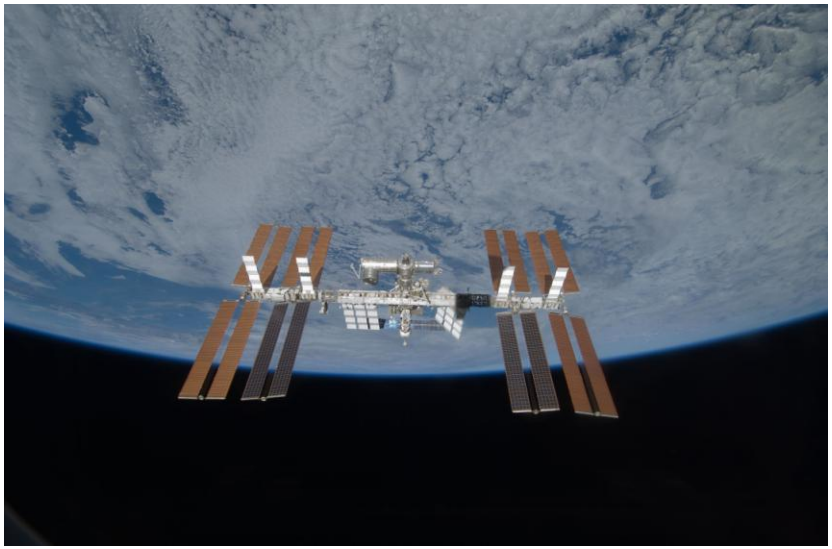
2010 Science Topics

- Sensors, Detectors, and Instruments
- Advanced Telescope Systems
- Spacecraft and Platform Subsystems
- Low-Cost Small Spacecraft and Technologies
- Robotic Exploration Technologies
- Information Technologies



2010 Space Operation Topics

- Space Communications
- Space Transportation
- Processing and Operations
- Navigation



2010 Exploration Systems Research Topics

- In Situ Resource Utilization
- Advanced Propulsion
- Life Support and Habitation Systems
- Extra-Vehicular Activity Technology
- Lightweight Spacecraft Materials and Structures
- Autonomous Systems and Avionics
- Human-Robotic Systems
- High-Efficiency Space Power Systems
- Entry, Descent, and Landing (EDL) Technology
- Cryogenic Propellant Storage and Transfer
- Exploration Crew Health Capabilities
- Exploration Medical Capability
- Behavioral Health and Performances
- Space Human Factors and Food Systems
- Space Radiation
- Inflight Biological Sample Preservation and Analysis

Example SBIR 2010 Solicitation Subtopics

Example 2010 Aeronautics Research	
Topic/Subtopics	**Topic/Subtopic Title**
A2	**Fundamental Aeronautics**
A2.01	Materials and Structures for Future Aircraft
A2.02	Combustion for Aerospace Vehicles
A2.03	Aero-Acoustics
A2.04	Aeroelasticity

Example 2010 Science	
Topic/Subtopics	**Topic/Subtopic Title**
S3	**Spacecraft and Platform Subsystems**
S3.01	Command, Data Handling, and Electronics
S3.02	Thermal Control Systems
S3.03	Power Generation and Conversion
S3.04	Propulsion Systems

Example SBIR 2010 Solicitation Subtopics

Example 2010 Space Operations	
Topic/Subtopics	**Topic/Subtopic Title**
O1	**Space Communications**
O1.01	Antenna Technology
O1.02	Reconfigurable/Reprogrammable Communication Systems
O1.03	Game Changing Technologies
O1.04	Long Range Optical Telecommunications
O1.05	Long Range Space RF Telecommunications
O1.06	Space Networking

Example 2010 Exploration Systems	
Topic/Subtopics	**Topic/Subtopic Title**
X2	**Advanced Propulsion**
X2.01	Earth-to-Orbit Propulsion
X2.02	Non-Toxic In-Space Propulsion
X2.03	Nuclear Thermal Propulsion
X2.04	Electric Propulsion Systems

2010 STTR Topics

- Small Probe Entry Descent and Landing System, and Information Technologies for Intelligent Planetary Robotics
- Atmospheric Flight Research of Advanced Technologies and Vehicle Concepts
- Technologies for Space Exploration
- Advanced Terrestrial, Airborne, and Spaceborne Instruments
- Next Generation In Situ Compositional Mapping Tools
- Innovative Technologies and Approaches for Space
- Wireless SAW Sensor Arrays
- Lidar, Radiosotope Generators, and Circuit Board Materials
- Technologies for Human and Robotic Space Exploration Propulsion Design and Manufacturing
- Rocket Propulsion/Energy Conservation

Nature of NASA Phase 1 and 2 SBIR & STTR Contracts

- SBIR contracts are fixed price contracts to be completed on a best effort basis.
- Company will own resulting intellectual property (data, copyrights, patents, etc.).
- Government has royalty-free rights for government use of intellectual property.
- Government protects data from public dissemination for four years after contract ends.
- NASA is a potential customer.

SBIR – Eligibility Checkpoints

- Organized for-profit U.S. small business (500 or fewer employees)
- At least 51% U.S. owned and independently operated
- Small business located in the U.S.
- P.I.’s primary employment with small business during the project

Before Submitting a Proposal

- Review prior year solicitation: http://sbir.nasa.gov/.
- Search and identify specific technical areas (subtopics) and lead center(s) of your interest.
- Request subject matter expert contact information from respective field center program POCs.
- E-mail/Call technical POCs and initiate dialogues.
- Learn technology needs and priorities.
- Visit and brief NASA on your companies capabilities, if the opportunity presents itself.

Proposal Review & Selection Criteria

- Proposal Review
  - Factor 1: scientific/technical merit and feasibility (50%)
  - Factor 2: experience, qualifications and facilities (25%)
  - Factor 3: effectiveness of the proposed work plan (25%)
  - Factor 4: commercial merit and feasibility (adjectival)

- Proposal Ranking and Selection
  - NASA Project/Mission Alignment
  - Value, Priority and Infusion Potentials
  - Champion/Advocate

Technology Infusion Initiative

- **Technology Infusion Managers (TIM)s are critical to technology adoption and Infusion**
  - (TIM)s provide key interface and leadership which enables the SBIR program to be a value added resource for all Mission Directorates (MD)s to strategically access, mature and apply portfolio based technologies more quickly, cost effectively and strategically.
  - Also they provide support for OCT (SBIR/STTR) portfolio management, Technology solutions development and implementation of infusion strategies.
- **Scope**
  - The TIMs currently provide a coordinated interface uniquely aligned at each center and its supported Mission Directorate programs, procedures and program management processes. Therefore, creating a synergistic environment in which to formulate and promote SBIR/STTR infusion opportunities to MD/Center programs and projects.
  - SBIR/STTR Technology Development/ Maturation and Infusion Opportunities

SBIR/STTR Center Points of Contact

SBIR Program Management:

- Program Executive: Carl G. Ray, Carl.G.Ray@nasa.gov , Headquarters
- Program Manager, Gary Jahns, Gary.C.Jahns@nasa.gov, Ames Research Center (ARC)
- Business Manager, Carlos Torrez, Carlos.Torrez@nasa.gov, Ames Research Center (ARC)
- Technology Infusion Manager, Rich Pisarski, Ryszard.L.Pisarski@nasa.gov , Ames Research Center (ARC)

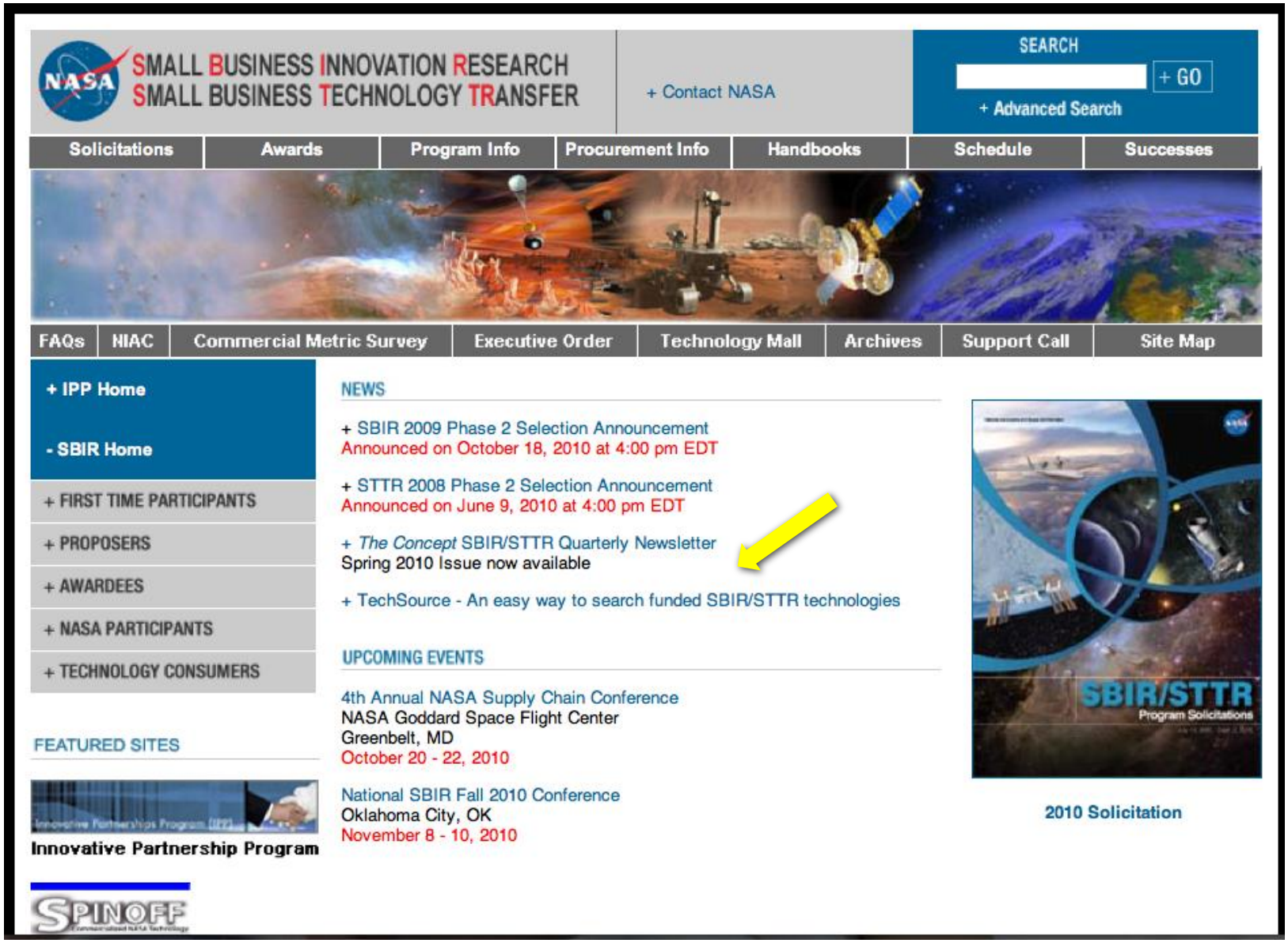
SBIR Mission Directorate Liason Centers:

- Luis Mederos, Luis.Mederos@nasa.gov (SOMD)
- Robert Yang, Robert.L.Yang@nasa.gov (ESMD)
- Richard Terrille, richard.j.terrile@jpl.nasa.gov (SMD)
- Gynelle Steele, Gynelle.C.Steele@nasa.gov (ARMD)

Center Technology Infusion Managers

- Kim Hines, Kimberly.K.Hines@nasa.gov , Ames Research Center (ARC)
- Ron Young, Ron.Young@nasa.gov , Dryden Flight Research Center (DFRC)
- Hung Nguyen, Hung.D.Nguyen@nasa.gov, Glenn Research Center (GRC)
- Jennifer S. Geiger, jennifer.s.geiger@nasa.gov, Goddard Space Flight Center (GSFC)
- Dr. Carol Lewis, Carol.R.Lewis@jpl.nasa.gov, Jet Propulsion Laboratory (JPL)
- Kathy Packard, Kathryn.B.Packard@nasa.gov, Johnson Space Center (JSC)
- Joni Richards, Joni.M.Richards@nasa.gov, Kennedy Space Center (KSC)
- Kimberly Graupner, Kimberly.E.Graupner@nasa.gov, Langley Research Center (LaRC)
- Lynn Garrison, Virginia.B.Garrison@nasa.gov, Marshall Space Flight Center (MSFC)
- Ray Bryant, Ray.Bryant-1@nasa.gov, Stennis Space Center (SSC)

NASA TechSource



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Search Text: Infrared Detectors ◉ Any Word ○ All Words ○ Exact match ○ Advanced Tips for Advanced Search!

Center: Awarding Center **Program:** Both **Program Year:** 2009 **Phase:** Any Search

Initial Search Filters: Keyword: Infrared Detectors (Any Word) Program Year: 2009

Displaying 1-10 of 43 First Prev 1 2 3 4 5 Next Last **Results Per Page:** 10 **Sort By:** Relevance Excel

72.59% Passively-Cooled Hyperspectral *Infrared Detectors* and Arrays

Proposal #: S1.04-9357 **Program/Year/Phase/Center:** SBIR 2009- 1 (JPL)
Contract #: NNX10RA62P **Start/End Date:** 01/29/2010 - 07/29/2010
Firm: EPIR Technologies, Inc. **Principal Investigator:** Silviu Velicu

Abstract: ... A constant demand exists to improve the sensitivity of trace chemical species measurement systems, which is often limited by the performance of the *infrared* photon *detector* components. The significant cooling required to reduce dark currents and increase detectivities is a practical concern ... *more*

58.86% High Performance Negative Feedback Near *Infrared* Single Photon Counting *Detectors* & Arrays

Proposal #: O1.06-8219 **Program/Year/Phase/Center:** SBIR 2009- 1 (JPL)
Contract #: NNX10CD90P **Start/End Date:** 01/29/2010 - 07/29/2010
Firm: Amplification Technologies, Inc. **Principal Investigator:** Yuriy Yevtukhov

Abstract: ... Amplification Technologies Inc ("ATI") proposes to develop the enabling material and device technology for the design of ultra low noise, high gain and high speed near-*infrared* single photon counting photodetectors and arrays sensitive in the 1000 nm to 1600 nm spectral region for long range space ... *more*

57.8% An Implant-Passivated Blocked Impurity Band Germanium *Detector* for the Far *Infrared*

Proposal #: S1.04-9317 **Program/Year/Phase/Center:** SBIR 2009- 1 (JPL)
Contract #: NNX10CE02P **Start/End Date:** 01/29/2010 - 07/29/2010
Firm: TechnoScience Corporation **Principal Investigator:** Jam Farhoomand

Abstract: ... We propose to investigate the feasibility of fabricating a germanium blocked-impurity-band (BIB) *detector* using a novel process which will enable us to: 1- fabricate a suitably-doped active layer using the well-established bulk crystal-growth process, which guarantees excellent dopant control ... more

Narrow Your Search

- By Center
  - ARC (7)
  - GRC (2)
  - GSFC (9)
  - JPL (12)
  - JSC (2)
  - Show more Centers
- By Program Year
  - 2009 (43)
- By Phase
  - 1 (43)
- By Program
  - SBIR (41)
  - STTR (2)
- By Firm
- By Firm Ownership Status
- By Contract Status
- By Technology Taxonomy

Outreach & Publications

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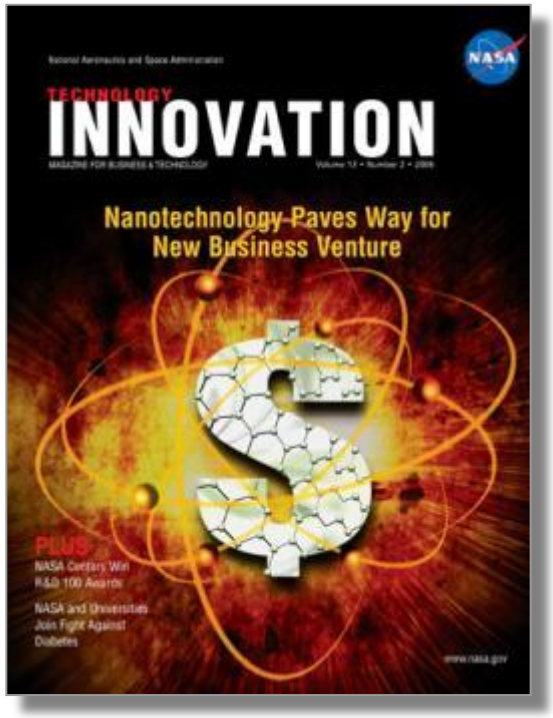


http://ipp.nasa.gov/innovation/index.html

http://sbir.nasa.gov

SBIR/STTR Program Current Year Submission & Schedule

2011 Program Solicitation

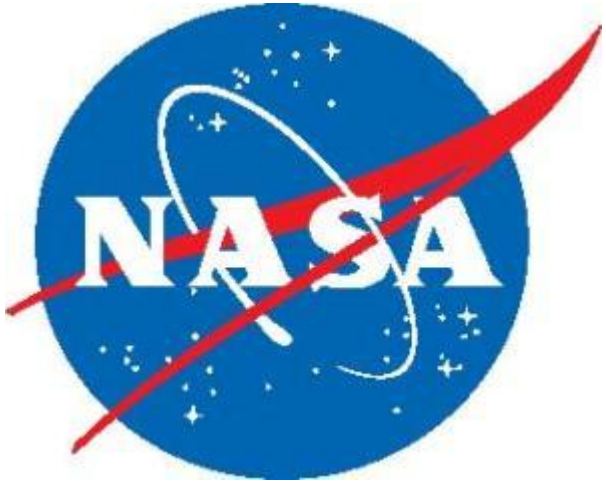
- Opening Date: 07/11/2011
- Closing Date: 09/08/2011
- Announcement: 11/23/2011

http://sbir.nasa.gov

Challenge

Help us determine how we can create a more effective partnership between the genius of the American entrepreneur and the power of the federal government.

--Charlie Bolden, NASA Administrator



National Aeronautics and Space Administration

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